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ABSTRACT

The author, herself a mother of twins, reviews research on exceptional twins. She considers reasons for fascination with twins and comments upon important advances in technology. Current research in Indianapolis to measure cognitive, perceptual, personality, and chromosome patterns of twins is described. Differences in the makeup of identical and fraternal twins are considered, as are specific dangers that can affect twins prenatally and perinatally. She describes experiences of parents of exceptional twins and discusses the feelings of the nonhandicapped twin. Sex differences in terms of vulnerability to disorders are noted, and the effect of family configuration on intelligence is addressed. Prevention through better medical care and nutrition is suggested. (CL)

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An Investigation of Exceptional Twins

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The appeal of twin babies is remarkable. No mother or father can venture forth with a twin stroller without causing every passerby to stop and peer inside, beam admiringly and cluck some cheerful comment. Either baby by itself might not warrant a second glance, but the two together make an irresistable combination. Twins have been the objects of fascinated interest in most societies. From the earliest times there are records testifying to their rarity and often to their special powers for both good and evil. Just as twins cause stares and comments, so do people who are different because they are handicapped. When twins, a rarity, are physically, mentally, or psychologically different from the normal, this is a double rarity because exceptionality is a rarity, too. Since I have an interest in twins and in exceptionalities, I thought it would be interesting to investigate these two areas further. I'm interested in twins because I have twenty-one year old identical twin boys. Remembering their births, I am very much aware of how fortunate my husband and I are that they are normal well-adjusted young men, for the first-born wasn't breathing at first. I remember the frantic efforts of the doctor-nurse team, the commotion, my prayers, the success--(his birth cry), the air lock, the isolette, the incubator, and the subsequent birth a few minutes later (totally unexpected) of his healthy brother. We came close to having an exceptional twin. Thank goodness we were at Parkview Hospital in Fort Wayne with all of its excellent facilities, doctors and nurses. However, I know that many parents of twins are not this fortunate and do have exceptional twins. I decided to investigate the area of exceptional

twins by investigating twin studies, and the causes, types, problems, and prevention of twin exceptionalities. This investigation has been fascinating but difficult because there are no studies on exceptional twins as such, but by reading articles, newsletters, and books about twins and by communicating with twin researchers and by interviewing mothers of exceptional twins, I was able to gather some material that was of interest to me and will probably be so to other mothers of twins and future mothers. As Peter Mittler, the twin specialist, said, "Man's preoccupation with the twin phenomenon stretches far back into mythology, partly perhaps because twins provide in miniature a model of man's evolutional development, embracing his search for identity both as an individual and as a member of society. It is this dialectic which finds its clearest expression in the twin situation.[1] And Aaran Scheinfeld, another twin expert, adds that, "What must be recognized is that twins do in certain respects constitute a distinctive group, and that their world may differ in certain ways from the larger world of the single-born among whom they find themselves. Beginning life under more than ordinary severe conditions, twins may thereafter present special problems to their parents, doctors, teachers, and friends--and, in time, to their mates and to other persons. Likewise, they themselves may tend to encounter unique difficulties or disadvantages."[2]

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1 Peter Mittler, The Study of Twins, "Preface," Penguin Science of Behavior Books, London, 1971, p. 23.

2 Aaran Scheinfeld, Twins and Supertwins, "Preface," J. B. Lippencott and Company, Philadelphia, 1967, p. 15.

Because this is so, twin studies are a necessity. Scientists have been showing increasing interest in twins and much new knowledge about them has become available and large numbers of twin-minded lay people--parents of twins, adult twins, teachers, and others close to twins--have readily cooperated in research projects. But as Scheinfeld mentions, "It must be recognized, however, that most scientific studies concerned with twins have been conducted chiefly in order to learn through them, more about human beings generally. Moreover, many of the findings which could have importance for twins and their parents have to a great extent remained sequestered in technical treatises. At the same time, most scientists have given little heed to the practical and personal problems going with or faced by twins and not encountered with or by singletons."[3] It's evident that much remains to be done in the area of twin research for twins, especially exceptional twins.

Mittler notes that the current twin study revival seems less concerned with the heredity-environment issue than with a broader and redefined interest in the interaction between biological and social aspects of behavior and development. Instead of the earlier global questions and terminology, scientists are now concentrating on attempting to isolate, identify, and measure specific cognitive processes. Perhaps now these twin studies will provide answers helpful to all children, normal and exceptional. For example, the ITPA twin study suggested that genetic factors were more important for the visual-motor than for the auditory-vocal channel, and independent evidence from studies of singleton children

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3 Scheinfeld, p. 16.

has confirmed that auditory-vocal tests are strongly influenced by environmental variables such as social class.[4] Attempts to study specific cognitive abilities are paralleled by work on specific environmental components and identifying them objectively as well as genetic variables. At the same time, recent work is characterized by increasingly precise and sophisticated technological advances. Among the more important advances relevant to the future of twin studies are more precise methods of diagnosing zygosity and the use of computer-based methods of recording psychophysiological correlates of cognitive processes. Furthermore, the rapid development of methods of studying the behavior and responsiveness of neonate and very young children should make it possible to study newborn twins while they are still relatively innocent of environmental influences--of a social nature at least. Also, more attention will be given to intensive studies of small numbers of twins, in particular, co-twin control. The co-twin method seems to lend itself somewhat better to a design where two different forms of teaching are compared. Future twin research is likely to be more concerned with the differential response to structured teaching situations than with the administration of what are essentially static tests of ability. There is also considerable promise in the use of operant conditioning and behavior modification techniques with identical twins. Future studies with identical twins will also focus on information about the "twin situation" which is badly needed. Researchers know remarkably little about psychology of the twin as an individual or as a member of a pair, as Mittler also points out. More information on

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[4] Mittler, p. 150.

the individuality and mutual relationship of the twin pair might well lead to a modification of design in twin studies of the future. Exceptional twins will benefit from the new methodologies and technologies in twin study development as well as the general population.[5]

The answers to the old controversial questions, "How do individual differences in ability and personality arise and how do inherited differences in people contribute to their differences in behavior?" will help scientists understand behavior development, both normal and abnormal. The department of Medical Genetics at Riley Hospital in Indianapolis is attempting to do this with their studies of identical twins and their families. A summary of some of these measures follows:

Cognitive Measures: Sentence completion measures are being administered to subjects in an effort to measure familial similarity in language and to try to answer questions such as "Why is there a significant variation in learning language? Are there specific experiences that make language development easier for a child? Can these be improved with the family's shared environment? and how do hereditary influences affect language development?

Special Ability Measures: Two special abilities are being measured. These are perceptual speed and spatial visualization. The studies are trying to determine if a genetic difference linked to the X-chromosome underlies the male-female differences. If genes influencing these abilities were located on the X-chromosome, a sex difference would occur, since women possess two X-chromosomes and men only one.

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5 Ibid., p. 149-160.

Personality Measures: Personality similarity in twins and their families is also being tested, particularly the question of possible mother effects -ie, whether personality similarities of the children will reflect the influence of their mother. Such influences can occur before birth (by nutritional and chemical effects) as well as after birth (by social learning and imitation). This part of the study is unique and of high interest.

Chromosome Study: The chromosomes of MZ and DZ twin pairs were studied to answer the question "Are structural variations of chromosomes genetic or are they partly or wholly due to effects of environment and laboratory technique? The study demonstrated that many chromosome variants are genetic, so now these chromosome variants can be applied with confidence to many areas of human research, not the least of which is telling MZ from DZ twins[6]--all of these studies in time will be applied in the direction of making life easier and better for exceptional twins or else preventing the occurrance of exceptional twins. Parents of twins are gradually becoming more aware of the importance of twin research, and they cooperate gladly, often sacrificing time and money. A report from a Mothers of Twins Club Newsletter explains what happens at a typical twin study.

> The Indiana University Medical Center in Indianapolis will never be the same! Four researchers, four sets of twins, one sibling and three mothers all gathered in the rehab. center at Riley Hospital this past Saturday (May 15) and either advanced or set back medical genetics a bit. Emily Harris, Ann Kluesmeyer, Pat Welch and Joe Dominik measured weighed, finger-printed, hand-printed, foot-printed, drew blood from, obtained urine and saliva

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6 Donna Huntzinger, editor, Special Deliveries, Newsletter of the Indiana University Twin Study, Vol. II, Issue 1.

> samples, gave a test to and otherwise tested Irene and her boys, Rosemary and her girls, Bev and her girls, and Jane, Luan and Karen Maple. A family medical history was taken from the mothers while the children ran through a battery of tests, including a perceptual speed test, an attitude interest test and other psychological tests. The research team was very friendly, explaining every test and answering all our questions thoroughly. Their search for information runs from the very complicated to the simple, but listening to this dedicated group of young people assured us that all the testing was worthwhile. One complicated procedure is the saliva test. We were asked to chew on a piece of gum-shaped paraffin to help us salivate into a glass tube. The saliva will be analyzed in a search for a unique amalase which can be traced through a family. The chromosome #1 is somewhere in the amalase and the researchers are trying to pinpoint it by studying the saliva. (Would you believe I forgot to ask why they were looking for hair or absence of it on the simple procedure where they were looking for hair on the middle joints of the fingers?) Siblings who are the same sex who are within two years of each other in age are also being used for the study. The siblings are used as the control group and the twins are tested to find the differences in each area. The fraternal twins help the researchers see how many of the genes are the same among the twins. We parents help the researchers and then we will get the results of the medical testing in six weeks. The blood is not only typed and determined Rh negative or positive, but also checked for eight other factors. Cholesterol levels will be measured and genetyping will be done. By studying the ridge counts and other features present in footprints and handprints, the researchers will also be able to determine if our twins are fraternal or identical. The children and their moms were treated to donuts, hot chocolate, coffee or tea and fruit during the testing.[7]

The attention given twins by medical scientists has been of great value to twins themselves. The knowledge of which diseases are hereditary can help to make clear whether or not, if one twin has an affliction, the other twin is also threatened by it and to what extent. If heredity plays any part in the development or severity of a given different disease or abnormality, the story may be quite different for identicals than for fraternals. The greater the chance that both twins of an identical pair

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7 Irene Bailey, "Dcuble Exposure," Vol. III, Number 10, May 1976.

will be similarly afflicted in the same way, the greater the role of heredity. But with fraternal twins, the more that heredity is involved in a given situation, the less the chance that both will be afflicted in the same way.

According to Scheinfeld, since so many twins as a group, do meet with adversity before or during birth, there will be an above average incidence of defects among them. Thus, congenital malformations are about twice as common among twins as among singletons; so, too, are some of the brain disorders due to injuries sustained during delivery. When twins are very premature, dangers of brain damage are increased, with the risk of incurring cerebral palsy being four to six times greater than in full-term babies. Again, certain eye defects may afflict twins more often than singletons, but most of the many twins who grew up with serious eye defects in former years were the unfortunate victims of incubator accidents which rarely occur today.[8]

Scheinfeld says that in comparing identical and fraternal twins, a somewhat larger proportion of the fraternals pull through safely, mainly for the reason that identicals may be confronted with more prenatal dangers. The division of a fertilized egg to form identical twins can take place very early or at a more advanced stage; and when and how the division occurs may have considerable importance for the twins. If the egg divides almost at once, the eggs would grow as if they were two different eggs so their development in the womb would be no different from that of fraternal twins--each identical twin would have the same hereditary traits but have

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8 Scheinfeld, p. 133.

its own placenta and outer bag, the chorion, and separate inner sac, the annion. This would be the safest environment for twins. In the majority of cases, however, in about three out of four pairs, identical twins are not separated in the womb. The two fetuses continue to develop closely together inside their one chorion and with one placenta. Almost always each twin is contained in its own fluid-filled amniotic sac. But in rare instances, these separate inner sacs are missing and identical twins are suspended in the same sac and fluid. This can be an extremely dangerous situation, inasmuch as their cords may become entangled, or one twin may crowd and injure the other. Also such dangers as intra-uterine transfusion or inefficient vascular arrangement of foetal circulation, causing decreased weight can occur. The lack of this amnionic sac is due to late division of the fertilized egg and this is also responsible for the conjoining of twins (Siamese Twins).[9]

Freedman agrees about the dangers of late division, saying that in fetal development of identical monochorionic twins, a competition occurs over the common blood supply, and one twin is frequently runted as a consequence.[10] Other reasons, according to Scheinfeld, for the hazards being greater for identicals is that at the very beginning, if a fertilized egg geared to produce only one baby is split in half, this in itself is a disruptive process--the same amount of food stored within the egg to start one baby on its way must now be divided between two.[11] These

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9 Ibid., p. 34-36.

10 Daniel Freedman, Human Infancy. "Individual Differences in Personality Development," p. 94.

11 Scheinfeld, p. 36.

prenatal conditions of crowding, lack of nourishment of fertilized egg and later of the fetus, the late dividing causing intra-uterine transfusion, interconnected foetal circulation, and conjoining all could cause exceptional twins. Most people are simply not aware of these causes of exceptional twins.

An interview with a mother of four-week-old, late-dividing identical twin boys illustrates the dangers of pre-natal environment. This thirty-year-old mother gained sixty pounds with this, her third pregnancy, and she knew ahead of time that she was having twins but wished she hadn't known because she worried so much about whether they'd be normal. She was in bed the last six weeks. She had an easy delivery, fortunately, but one twin weighed seven pounds three ounces while the other weighed five pounds. The smaller twin was born first and was anemic in addition to being underweight. The bigger twin was born very red-looking, for he had too many red blood cells and a blood pressure that was much too high, dangerously so; he also had one thigh larger than the other. The larger twin had robbed the smaller one of nourishment and blood because of the intra-uterine transfusion condition which was due to their dividing late and having only one placenta, chorion, and amnion with resulting inter-foetal circulation. The large thigh was a tissue problem due to his position in the environment. The twins had to be rushed from Wells Community Hospital in Bluffton to Fort Wayne's Luteran Hospital intensive care unit, causing much emotional and financial stress for the parents. The larger twin had blood taken from him to lower his blood pressure. Both twins were watched, tested, and cared for carefully, which the parents appreciated.

But there was no insurance in effect until after the tenth day of delivery for these parents, which caused financial problems, and the many trips to Lutheran at feeding time caused hardships because of two other brothers, so the worry and prayers about the twins were excessive. Still, these parents are lucky--their twins are probably going to be alright--they will not become exceptional twins.[12] (Note: The larger twin died in July 1977 from a lack of a bile duct, a congenital problem.)

However, a friend of this mother was not so fortunate. This woman had identical twin boys as a first pregnancy when she was thirty years old. She had uremic poisoning during her pregnancy although she continued to teach home economics in junior high school until her delivery. She did not know she was going to have twins. One twin weighed three pounds six ounces and the other weighed four pounds fourteen ounces. Because of a variety of causes--the mother's uremic poisoning, the twin's prematurity and size, lack of lung development, low blood sugar, convulsions on the fourth day, and jaundice--one twin is retarded and the other is normal. This twin came home from the hospital at five weeks with a spastic condition and had rubella with high fever at twelve months. The parents suspected problems of course, and were told to expect retardation at twelve months. He has a mental age of three or so. The boys are now fourteen years old. Both have lived at home until last January. Then the retarded one was put in Fort Wayne State School (on a temporary basis) because the family could not cope with him any more due to his hyper-activity. He has gone to Johnny Appleseed and Gethsamane (both special

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12 Donna Sheley, interview at Zanesville, Indiana, July 17, 1976.

education schools) and still goes to Gethsamane while living at State School. The family has sacrificed greatly because of this exceptional twin and the future doesn't look too bright for him, although Dr. Coburn, a biochemist at State School is trying to control his hyperactivity so he can return to his family. Tests are being done using co-twin control, taking urine samples after controlling the food intake, trying to identify perhaps some chemical that the retarded twin has that the other twin doesn't have. Many hopes are built on this experiment that is being carried out with advanced technologies and help from Eli Lily Laboratories, but as Dr. Coburn said, "It's a shot in the dark, really. Frankly, I'm not too optimistic."[13] But it is an attempt. If this fails, perhaps science will come up with another idea the mother hopes. She and her family have done an admirable job so far in caring for this exceptional twin in spite of the many problems they face: the twin's echolalia and lack of meaningful communication, his self-centeredness, demanding, hyperactivity, the discipline problem, baby-sitters, the other twin's resentfulness at times (and younger brother's also), the limitations on the family life style, the social behavior problems with the exceptional twin in restaurants and swimming pools, and most of all the spoiling of the twin relationship, the "twin situation." How much anguish there must be for the whole family and especially the normal twin when they consider what might have been. The normal twin must feel an extreme sense of incompleteness and frustration as he watches his retarded twin grow up so differently from him. And the retarded twin is also tragically affected his mother says. He realizes

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[13] Dr. Coburn, Head of Biochemistry Dept., Ft. Wayne State School, telephone interview, July 20, 1976.

he is different and is also frustrated. No doubt he, too, senses the loss of the normal twin relationship and twin situation.[14] Having one twin normal and the other exceptional is a tragic happening.

Exceptional twins then can result from pre-natal and post-natal causes. Twin deliveries also present dangers. Twins are more often delivered breech than are single births. In 37 percent of twin deliveries at least one of the twins is delivered by breech presentation, and breech births often result in birth injuries according to etc.[15] (According to information from the genetics department of Riley Hospital.) Scheinfeld mentions that with twins, a large proportion do not have time or are too crowded to revolve in their sacs so that their heads are down and in the best position for the exit. The doctor is also required to manipulate twins into a proper position for delivery much more often than is necessary for single babies. Thus, having twins, especially identical twins, is a high risk situation.[16]

As stated in the Special Delivery newsletter, "In boy-girl twins, girl twins generally have a better chance of surviving from birth onward."[17] Dr. Scheinfeld reinforces this idea by pointing out that if either twin is afflicted by a serious defect or illness, it is much more likely to be the boy, and if both are afflicted, the condition in the boy may be more serious. Many hereditaty conditions, known to be sex linked, appear

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14 Marily Gibson, interview at her home, Rt. 1, Yoder, Ind., July 26, 1976.

15 Special Delivery, p. 6.

16 Scheinfeld, p. 41.

17 Special Delivery, p. 4.

largely in males, and if these run in a given family, the boy of an opposite-sex twin pair may often be afflicted whereas the girl twin usually will not be. Among these sex-linked conditions are color blindness, several of the mascular disorders, and a number of skeletal and skin afflictions. If both the boy and girl acquire the same infectious disease, or are injured in the same accident, the risk of serious consequences is usually greater for the boy. If the twins are nervous or emotionally disturbed, the girl may show it more often by mannerisms such as nail biting, loss of appetite, or contrariness; the boy in a more active way by aggression and unruly behavior, and sometimes through speech disorders, such as stuttering.[18] This, of course, could lead to situations where the boy twin would become an exceptional child.

In his book, Mittler also brings up the idea that twins are highly vulnerable individuals both biologically and cognitively. Their birth and early development is not without risk, and they tend, as a group, to be somewhat below average in physical and intellectual development. One study found, for two different groups of identical twins aged between five and fifteen, that the twin with the lower birth weight also had the lower verbal and performance IQs on the Weschler Intelligence Scale for children; the trend was particularly marked for performance tests. Also, he says, difficulties arise even if investigation of twins is limited to those with severe subnormalities because twins are more vulnerable to the effects of early damage to the brain and central nervous system than singletons. In general, subnormal twins are found in greater than expected

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18 Scheinfeld, p. 188.

proportions both in hospitals for the mentally subnormal and in the community. Moreover, differences even within an identical pair may not be due either to heredity or environment in the normal sense of these terms, but rather to the different biological hazards inherent in twinning. Thus, the second born twin may suffer from anoxis or brain damage due to prenatal or perinatal difficulties. There is, furthermore, evidence from case studies that one identical twin may be severely subnormal and the other normal.[19]

When discussing mental traits of twins, one must distinguish between different kinds of twins. There are those born prematurely and with initial handicaps, and also some full-term twins who sustain injuries and impairments in pre-birth accidents. These must be distinguished from twins who enter the world just as fully developed, healthy and sturdy as the average single born. It does appear from many studies, Scheinfeld mentions, that their intelligence test scores collectively may be from five to nine points below the average for singletons of the same age and background. But "premies" and those born with some sort of impairment lower the average for all twins. The chief causes of any IQ deficiencies or school backwardness among young twins--where not traceable to some inborn or prenatally-caused impairment--usually lie in speech and language deficiencies, which are considered as resulting if twins are left to themselves too much. In addition, the rather rare habit of "twin language" and helping to develop it is the further fact that twins may have less chance than singletons to converse with other children and perhaps with adults

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19 Mittler, p. 133 and p. 142.

as well. These effects are apt to be most pronounced in families with no other children, and particularly in the poorer and less favored groups, where mothers are hard-pressed for time and may be especially inclined to leave twins to themselves as much as possible.[20] Scheinfeld also points out that such early deficiencies as there may be in twins tend to decrease or disappear in time and they found in a number of studies that twins over sixty years old scored as high on psychological tests as did singletons the same age and showed even less mental decline than average for persons their age. So twinship need not be a barrier to high intelligence and achievement. Innumerable twins with high IQs and top grades are listed in schools everywhere.[21] These exceptional twins exist in large numbers all over the world--the gifted twins, and so, everyone is happy about this one kind of exceptional twin. In an interview with Dr. Patricia Bader, she brought out another theory that she found very convincing after reading the studies about twins and intelligence. This theory contradicts Dr. Scheinfeld's beliefs about twins and intelligence.[22] According to this new theory, variations in scholastic aptitude scores parallel trends in family size and the spacing of children. In a confluence model the author tried to capture the effects of the immediate intellectual environment on the intellectual growth and to specify how individual differences emerge in the social context of the family. The basic idea of the confluence model is that within the family the intellectual growth of every

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20 Scheinfeld, p. 138-139.

21 Ibid., p. 140.

22 Dr. Patricia Bader, Director of Genetics, Caylor Clinic, Bluffton, Indiana, July 6, 1976.

member is dependent on that of all the other members, and that the rate of this growth depends on the family configuration. Different family configurations constitute different intellectual environments. Twins score consistently and substantially lower on intelligence tests and other tests of intellectual performance than do nontwins. For example, in the National Merit Scholarship sample, twins achieved an average score of 98.0, but singly born children an average of 102.57. Other studies agreed with these findings. Admittedly, biological factors may be involved here, but deficits for twins and larger multiple births would also be expected according to the confluence model. Twins have, of course, the shortest possible gap between suscessive siblings. Thus, a family with two singly born children and a family with twins represent quite different intellectual environments. Important evidence of the environmental effects on the intellectual growth of twins comes from the Record study. It follows from the confluence model that the intellectual performance of twins who were separated early in life should be higher than that of twins reared together. Records reported that twins whose co-twins were stillborn or died within four weeks achieve nearly the same average intelligence as nontwins. The intellectual deficit of twins could have a biological basis, of course, and the higher intelligence of twins who lost their co-twin may involve unknown genetic factors, but future research will shed light on this. A variety of findings reveal the impact of family configuration on intelligence: Intellectual performance increases with decreasing family size. Children born early in the sibship perform better on intelligence tests than later children when intervals between successive births are relatively short. Long inter-sibling spacing appears to cancel the negative

effects of birth order and in extreme cases to reverse them. In general, long intervals enhance intellectual growth. The adverse effects of short intervals are reflected in the typically low IQs of children of multiple births.[23] There are more findings from this confluence model, but what has been quoted so far is food for thought for mothers and fathers of twins. There will no doubt be more research done on this concept, for the implications for all children including normal and exceptional twins are great.

Even Dr. Scheinfeld agrees that unfortunately many twins do not have good minds, and that the proportion of mental defectives among twins is relatively higher than it is for singletons. Much of this could be explained by factors already discussed: prenatal deficiencies, accidents at birth, and effects of prematurity. But some experts believe there is a special likelihood that defective twins will attract attention and be institutionalized more readily than will singleton defectives, making the recorded incidence of mental defects in twins seem larger than it really is.

Of particular interest in the case of twins is Downs syndrome. Accounting for about five to ten percent of all serious mental retardation, this defect may have a relatively higher incidence among twins then among singletons mainly for this reason: The risk of bearing a mongoloid child goes up sharply among older mothers, who, in turn, produce above average numbers of twins. This type of idiocy is caused by a chromosome abnormality (an extra chromosome) in a fertilized egg which throws the development out of gear. Among other inborn human defects traced to abnormal chromosome numbers are the "Klinefelter" syndrome in males, and the "Turner" syndrome

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23 R. B. Azjone, "Family Configuration and Intelligence," Science (Vol. 192, April 1976), pp. 227-235.

in females--both involving defective sexual development and often also, mental retardation. As with mongoloid idiocy, when either of these abnormalities is found in twins, it will invariably affect both if they are identical, but probably only one if they are fraternal. While twins are proportionately more likely than singletons to be born with mental defect or retardation, they are not more likely to be born with any greater predisposition to mental disorder or insanity. Some--but not all--types of epilepsy and cerebral palsy may cause mental retardation, and may occur in one identical twin and not the other, according to Scheinfeld.[24]

Mrs. Parks from Ft. Wayne is an example of a mother who has many problems to deal with since she is the mother of exceptional twins. If having one exceptional twin is tragic, having twins that are both exceptional is even more tragic. She has nine-year-old identical girls, both of whom have cerebral palsy. Her twins were six weeks premature and have the spastic kind of abnormality which is not inherited but happens at birth or prenatally, probably due to anoxia. One twin, Karen, is affected much more severely than the other, for she is blind from an undeveloped optic nerve while her twin, Kathleen, is only crosseyed. Karen is also severely retarded while Kathleen is not, although she does have perceptual problems. The mother feels the blindness and retardation were caused prenatally since she'd had a miscarriage just before having the twins. Having these exceptional twins caused many problems for the parents such as the accepting of the cerebral palsied condition of <u>two</u> children and twins at that, accepting Karen's blindness (especially difficult for them), as well as

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[24] Scheinfeld, p. 108, 141, 140.

her severe mental retardation, going through many surgeries for Karen and facing more, raising of Kathleen to not to feel sorry for herself and to be independent, having the two brothers and others accept the twins, maintaining a marriage and family in spite of their "hell," putting up with two years of constant crying from the twins their first two years, sending dependent Karen away to Silvercrest School (a special education boarding school) and needing to restructure themselves for her return soon, finding information about available services (mostly from other parents of exceptional children), finding baby sitters, contending with financial debts, needing $500 for braces in cash, discovering agencies that wouldn't cooperate with each other, worrying about Kathleen's adolescent and adult needs, worrying about Karen's future and possibly finding a residential home for her. A staggering amount of problems face parents when exceptional twins are born to them.[25]

It seems clear that exceptional children in general and exceptional twins in particular should be prevented if possible. If the general population and young women especially became more aware of conditions that cause twin exceptionalities and ways to prevent them entirely or lesson the severity of the problem, everyone would benefit.

Mrs. Marilyn Gibson, the mother of the normal and retarded hyperactive twins believes that prevention depends on expectant mothers receiving better care. Although she said she should have been more aware of the dangers of her uremic condition, she also blames her doctor. She feels some doctors suffer from an ego problem and so refuse to call in experts

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25 Mrs. Marilyn Parks, St. Francis class visitation, July 1976.

when they encounter problem patients. They should be more up-to-date than some of them are on prenatal care and twin care. The doctor scarcity needs to be solved, too, so that expectant mothers can be taken care of by a doctor that the women want and have confidence in, if, for instance, their own doctor retires or they move to a new town. She also stresses the need for good nutrition for teenage girls since many are malnourished for years before becoming pregnant which could cause exceptionalities.[26]

Mittler believes that refined longitudinal studies on twins with large numbers of subjects are needed for prevention. He believes that twin studies have advanced and will continue to advance the frontiers of genetics significantly. He also sees the need for inter-disciplinary research along with more studies on the twin situation.[27] Scheinfeld has several points on prevention of twin exceptionalities, too. Detecting accurately the presence of twins during the fifth month of pregnancy or earlier is possible by the heartbeat recording method; by ultrasonagrams, pictures taken with ultrasound; by a telemetering device to detect heartbeats as early as the fourteenth or fifteenth week and by thermography, a technique of revealing placental position by photographic imaging of the skin-surface temperature over the womb. Twin detection will give the doctor clues he needs to insure a safe delivery. He also says that the various other kinds of afflictions and defects which are not due to twinship itself but to prenatal or delivery accidents can be much reduced or eliminated by advances in medical knowledge and techniques. He says further that if a

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26 Gibson interview

27 Mittler, p. 53 and 160.

mother today is healthy and has received good prenatal and delivery care, there is only a minimal risk that any pair of twins born to her will be defective. In support of this are findings that the incidence of prematurity, abnormality, and defects is very much lower among twins born to mothers in the more favored groups than among those in the underprivileged groups.[28] Raising the standard of living for the country as a whole would be necessary then to prevent exceptionalities. In addition, the general public needs to be made aware of the factors leading to exceptionalities, so more information on family planning, genetic counseling, nutrition, and health needs to be disseminated in and out of school.

Vincent and Margaret Gaddis think that in cases where a mother is known to be a carrier of Down's syndrome, genetic counseling is in order and also controlled pregnancies by using the amniocentesis test that will detect at least twenty-five genetic disorders and other problems. Therapeutic abortions would be suggested where the sample was abnormal. Some doctors are even attempting the extraordinarily delicate operation of removing the fetus from the womb to give transfusions to babies, replacing their blood, where there is Rh blood incompatability. They also point out that in the next decade, scientists will be not only able to control the number of babies where fertility drugs were taken by the mother, but also to improve their physique, mentality, and even their abilities. They also believe that defective children can be prevented by preventing conception at full moon if the mother was born at full moon, quoting from

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28 Scheinfeld, pp. 37 and 134.

some work done by Dr. Eugene Jonas from Czechoslovakia who uses computers relating conception dates to the planetary patterns at the mothers own birth dates. They also believe that mothers expecting twins should stand the pain and have no anesthetic and that the twins should choose their own time to be born--like good ripe fruit ready to fall from a tree.

The Gaddis' also point out that "human engineering" is a prospect for the immediate future. Perhaps the blood supply to the fetus could be vastly improved for maximal brain growth and physical health. Perhaps stockpiles of synthetic proteins, antigens, enzymes, and hormones might be available. Perhaps scientists could even transform the human female's placenta into one like that of the admirable little armadillos--and reduce the risk of miscarriages, still-births and abnormalities. Of course, the ethical problems connected with this genetic alchemy stagger the mind. Another suggestion they have is the use of a "birth suit," an abdominal decompression chamber which relaxes the womb. For the last ten weeks of pregnancy, the mother either attends a clinic or rents a suit for daily treatment at home. Doctors claim that fetal distress is cut by 80 percent. Use of the suit prevents the emerging infant's brain from receiving too little oxygen. "Decompression babies," including twins, develop faster and are more robust. None has had cerebral palsy and their language skills are exceptional, many talking well at a year-and-a-half. Some obstetricians believe that with twins, the cord should not be cut too quickly. Their survival can depend on their being allowed to receive all the blood from the placenta. If children are born less than a year after a previous birth, they then have lower weights and IQs and more neurological problems. A recent study states, "The mother perhaps has had insufficient

time to restore supplies of critical nutrients required by the fetus for normal development of the brain." So longer birth intervals are needed. Research today tends more and more to suggest that chemical imbalance is one cause of retardation and that vitamins and medication or dieting can be of radical help in preventing and improving such conditions in the future.[29]

One can only say that growing hope for many exceptional twins with handicaps is being offered by new treatments, by advances in special education methods and institutional care, and by increasing concern on the part of scientists, the public and the government. For future twins, improvements in prenatal care and conditions and in delivery techniques and in all the other areas mentioned earlier will undoubtedly reduce the number entering the world as exceptional twins with severe handicaps.

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29 Gaddis, pp. 28, 33, 38, 55, 56, 57, 96, 160, 190, and 191.

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